

LOWER YUKON RIVER REGIONAL PORT PROJECT: SITUATIONAL ANALYSIS AND POTENTIAL IMPACTS



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EXECUTIVE SUMMARY

The City of Emmonak is located near the mouth of the Yukon River on the coast of Western Alaska, approximately 10 miles from the Bering Sea. This small Yupik Eskimo community of 800 residents is recognized as the most suitable site for a port and dock facility in the lower Yukon region. Emmonak is strategically situated to provide basic shipping and transportation redistribution services to 13 other small communities in the lower Yukon region, serving over 5,500 residents in total.

Despite the lack of any port infrastructure in Emmonak, maritime activity has significantly increased in recent years. In 2010, more than 50,000 tons of cargo was shipped through Emmonak, this is more than triple the cargo delivered in 2002 (Figure 1). Today, the lack of infrastructure hinders industry, causing delays and general inefficiencies in transporting cargo. For example, Kwikpak Fisheries—the region’s largest private employer—must operate heavy equipment to build earthen ramps allowing barges to offload, leading to problems with congestion, erosion, and safety.

Local maritime businesses in Emmonak have demonstrated substantial growth despite the lack of a port facility. These businesses establish Emmonak as an economic center, providing employment, income, and services to residents throughout the lower Yukon region. The proposed Lower Yukon River Regional (LYRR) Port project would construct a modern barge landing facility and upland staging area in Emmonak, facilitating the safe and efficient offloading of cargo from barge vessels that are the primary resupply method for the community. This project is an investment in fundamental maritime infrastructure that would directly support continued economic growth in lower Yukon River communities to help stabilize and diversify economies largely dependent on government employment and unpredictable commercial fisheries.

Current Challenges

This facility would directly support barge delivery services and maritime industry growth in Emmonak by addressing three current operational challenges:

- **Overcrowding**

The current unimproved condition of the barge landing facility and inefficient offloading operations create periods of significant overcrowding and barge backup.

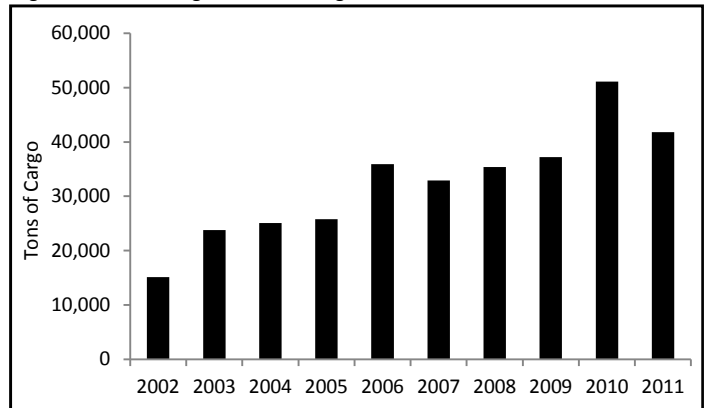
- **Port Regulation**

Local oversight and regulation of cargo deliveries into Emmonak is extremely limited. Inconsistent local management and disorganized operations significantly impact the reliability of current cargo and fuel delivery and redistribution through Emmonak.

Primary report objectives:

1. Describe the proposed port construction plan and general socioeconomic characteristics of study area communities.
2. Summarize local challenges to barge operations on the lower Yukon River.
3. Discuss the potential for Emmonak to serve as a regional redistribution hub and how improved maritime infrastructure may benefit local communities.

Figure 1. Tons of Cargo Moved Through the Port of Emmonak from 2002-2011



Source: Municipality of Emmonak



- **Erosion and Flooding**

Persistent riverbank erosion and flooding pose a significant threat to the existing physical infrastructure of local maritime industry businesses.

Status as a Redistribution Hub

There are currently no established port or harbor facilities on more than 700 miles of Western Alaska coastline between Bethel and Nome. Located at the mouth of the Yukon River with access to deep river channel morphology for barge maneuvering and landing, Emmonak is recognized as the most suitable site for a regional hub. Several commercial barge lines currently deliver cargo to Emmonak for redistribution to other lower Yukon River communities, but the lack of modern barge landing infrastructure has limited the redistribution capacity and efficiency of operations in Emmonak. The LYRR Port project would provide the infrastructure capacity to solidify Emmonak as a cargo redistribution hub and directly impact the quality of life of residents by reducing living expenses and growing the economy.

- **Reduced Cost of Living**

Local storage and redistribution capacity may achieve economies of scale that could alleviate some of the significant costs of goods and fuel in the lower Yukon region.

- **Supporting Economic Diversity and Stability**

Maritime industry growth and expansion in Emmonak may help develop a more diverse economic base that would reduce local reliance on fisheries and government employment.

Intermodal Transportation Linkage

Extremely limited road and rail systems in Alaska fundamentally inhibit the connectivity of communities across the state. Intermodal transportation linkages through the LYRR Port connecting marine shipping operations and interior Alaska transportation networks may allow lower Yukon River communities to benefit from economic opportunities associated with the regional development of oil and gas, transportation, and other maritime industries.



INTRODUCTION

Project Description

The City of Emmonak is located near the mouth of the Yukon River on the coast of Western Alaska, approximately 10 miles from the Bering Sea. This small Yupik Eskimo community of 800 residents is recognized as the most suitable site for a port and dock facility in the lower Yukon region capable of receiving ocean barge shipments. Emmonak is situated strategically to provide basic shipping and transportation redistribution services to 13 other small communities in the lower Yukon region, serving more than 5,500 residents in total.

The proposed LYRR Port project would construct a modern barge landing facility and upland staging area in Emmonak, facilitating the safe and efficient offloading of cargo from barge vessels that are the primary resupply method for the community. This project is an investment in fundamental maritime infrastructure in an economically-challenged region of rural Alaska. It would directly support continued economic growth in lower Yukon River communities to help stabilize and diversify economies dependent on government employment and unpredictable commercial fisheries.

Study Purpose

This report is primarily a compilation of information describing the proposed LYRR Port project and summarizing the potential impacts of construction on study area communities in the region. Primary report objectives include:

1. Describe the proposed port construction plan and the general socioeconomic characteristics of the study area communities that may be impacted by the project.
2. Summarize immediate challenges to local maritime industry and barge delivery operations met by the proposed project, including discussion of how these improvements may impact the region.
3. Discuss the potential for Emmonak to serve as a redistribution hub for the region, and the strategic maritime industry opportunities that may develop from increased maritime capacity.

Methods and Sources

This report includes a combination of primary and secondary research. Data sources include Alaska Department of Labor and Workforce Development (ADOLWD) for employment and population data and U.S. Census Bureau for census data and American Community Survey data. The National Oceanic and Atmospheric Administration's (NOAA) Community Profiles for North Pacific Fisheries, Alaska also provided basic information on communities and economic activity in the study area. A variety of reports provided community and region specific socioeconomic, cost of living, maritime industry, and infrastructure information. A list of referenced reports is provided in the appendix. Primary research included interviews of key informants working locally in Emmonak and the larger region. Key informants included employees of the municipality, processing plant managers, construction project managers, and shipping industry managers and operators.

Limitations

Any report describing potential future conditions or activities is subject to the significant limitations of uncertainty. A variety of economic factors and market forces, both local and global in scope, may affect the significance and distribution of the impacts of a new port facility on the lower Yukon River. This report incorporates no economic modeling or predictive analysis in its description of potential impacts. Instead it relies on the local knowledge of key informants, and information from previously published studies to describe the project and present possible outcomes. Data limitation and quality issues are a persistent problem for studies of remote Alaska communities. Specifically, study area socioeconomic data from the U.S. Census Bureau's ACS suffers from high margins of error. This data is included for descriptive purposes and not incorporated in any quantitative analysis. For this reason, potential impacts of the proposed port construction in Emmonak are largely qualitative in nature.



PROJECT BACKGROUND

During 2009, funding from the State of Alaska was utilized to undertake construction, design, and engineering plans for the LYRR Port in Emmonak; these plans were completed and permitted in 2012. A one-time general obligation bond of \$3 million was authorized in 2012 to provide initial funding for the construction of the port. The total estimated cost for this project is \$16.6 million, leaving a budget shortfall of \$13.6 million required to complete construction (Table 1.).

Project Design Plan

The LYRR Port project design meets both current demands and anticipated future demand, with the additional benefit of river bank stabilization and erosion control. There are two primary components of the design: 1) a dock portion constructed of sheet-pile cellular bulkheads, anchored by pilings reinforced with armor rock, with an adjacent raised pad for cargo loading and staging; and 2) a barge landing ramp of poured concrete, stabilized by four sheet-pile cellular bulkheads and including anchor rock protections. The dock structure would allow for barge side tie-up and the crane offloading of smaller cargo, while the ramp will allow for the efficient offload of heavy equipment and large volume rock products. The raised pad will provide stabilized surface area for container and cargo storage and staging during loading operations. This design configuration has been identified by U.S. Army Corps of Engineers (USACE) as ideal for sub-regional redistribution hubs because it allows multiple barges to offload at a time and gives operators several options to maximize efficiency.

Phase one of the project plan includes site preparation, erosion control and construction of the dock and staging area, with a total cost of \$10,100,000. Phase two includes site preparation, erosion control, and construction of the barge landing ramp, with a total cost of \$6,500,000. Total project costs are \$16,600,000 (Table 1). With planning, design, and permitting complete, the LYRR Port project is job ready. This project is moving forward with initial 2012 funding that is being utilized to purchase steel dock structure materials for shipment to Emmonak in 2014.

Table 1. Project Cost Estimates

Phase 1- Dock	
Site Preparation	\$2,900,000
Dock and Erosion Protection	\$7,200,000
Phase 1 Total	\$10,100,000
Phase 2- Barge Landing Ramp	
Site Preparation	\$1,800,000
Ramp and Erosion Protection	\$4,700,000
Phase 2 Total	\$6,500,000
Project Total	\$16,600,000
Funding Acquired in 2012	\$3,000,000
Budget Shortfall	\$13,600,000



STUDY AREA PROFILE

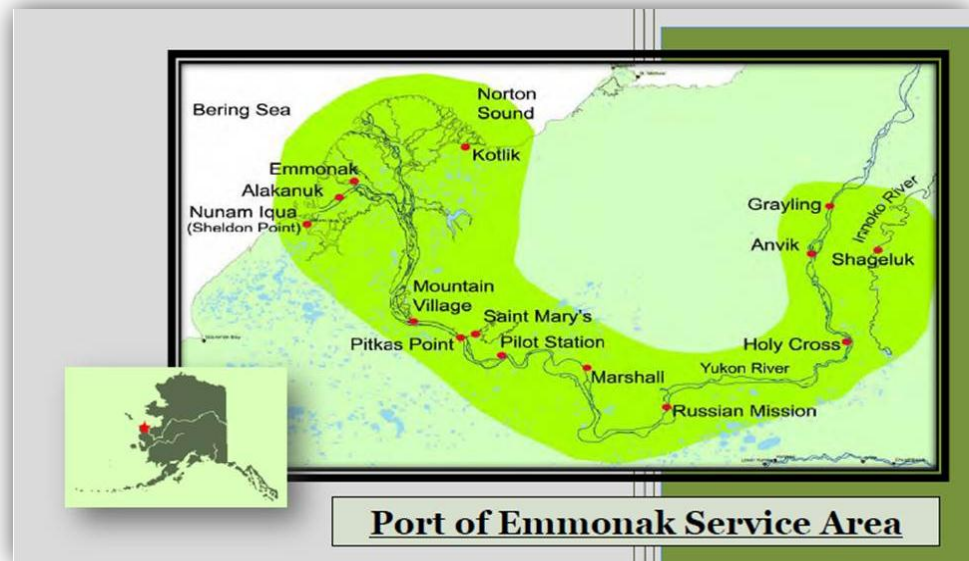
Study area communities in the lower Yukon region that would be impacted by the proposed LYRR Port facility in Emmonak include:

Alakanuk, Nunam Iqua, Emmonak, Kotlik, Mountain Village, Pitkas Point, St. Mary's, Pilot Station, Marshall, Russian Mission, Holy Cross, Anvik, Shageluk, and Grayling (Figure 1). The nearby coastal communities of Scammon Bay and Hooper Bay may also receive barge service through the LYRR Port. These communities are contained by the Wade

Hampton and Yukon-Koyukuk Census Areas. The Calista Corporation is the regional Alaska Native corporation established by the Alaska Native Claims Settlement Act (1971) for the Yukon and Kuskokwim region. The Calista region includes 56 villages and 45 village corporations, including all study area communities except Holy Cross, Anvik, Shageluk, and Grayling, which are part of Doyon, Limited Corporation.

These lower Yukon communities are home to primarily Yupik or other Alaska Natives, ranging in population size from less than 100 residents in Anvik and Shageluk to more than 800 in Mountain Village (Table 2). Spread along the lower 300 miles of the Yukon River, these communities have no road system connection to the rest of the state and depend on the Yukon River for transportation, cargo, and fuel shipments.

Figure 1. Map adapted from USACE Alaska Barge Landing Report, courtesy of Michael L. Foster & Associates, Inc.



A typical barge serving the lower Yukon region. Photo courtesy of Michael L. Foster & Associates, Inc.



Residents of these villages share many of the substantial socioeconomic challenges that burden much of rural Alaska: high rates of poverty and unemployment, low wages and income, and high cost of goods and fuel. The average income among study communities is less than half of the state average and the unemployment rate is more than double. The percent of persons below the poverty line in study area communities is at least double and sometimes triple that of the state average (Table 2).

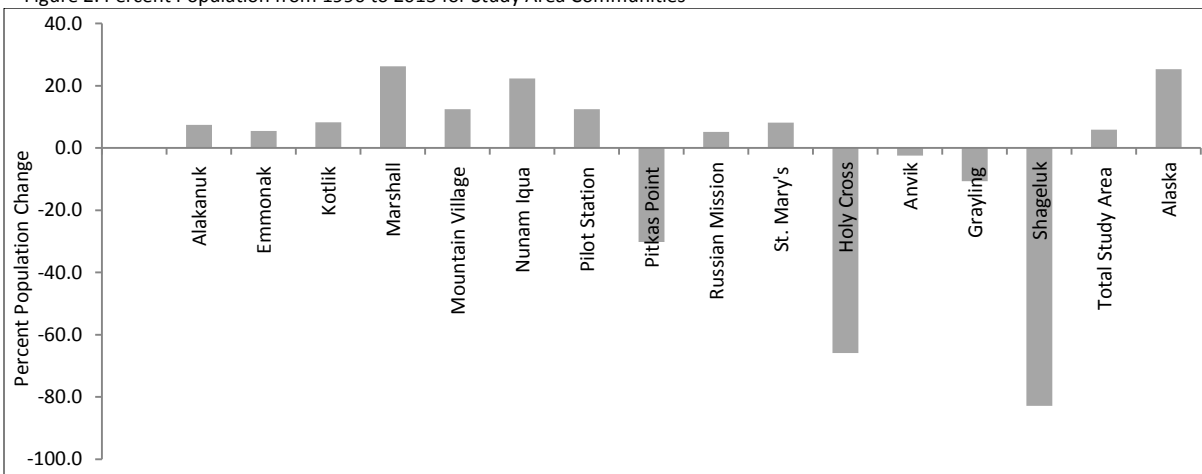
Table 2. Selected Demographic and Economic Characteristics of Study Area Communities

Community	2012 Population	% AK Native	Per Capita Income	% Unemployment	% Persons Below Poverty
Alakanuk	706	95	\$11,868	22	34
Emmonak	754	96	\$15,865	18	19
Kotlik	628	97	\$10,403	30	32
Marshall	413	95	\$11,306	54	16
Mountain Village	829	92	\$11,623	21	19
Nunam Iqua	183	91	\$15,308	6	15
Pilot Station	596	98	\$10,532	36	28
Pitkas Point	102	97	\$12,146	29	22
Russian Mission	313	96	\$9,971	32	33
St. Mary's	523	92	\$18,176	19	18
Holy Cross	181	92	\$20,487	29	16
Anvik	85	93	\$10,640	26	33
Grayling	178	87	\$11,093	33	30
Shageluk	69	90	\$14,923	18	30
Study Area (average)	397	94	\$13,167	27	24
Alaska	736399	15	\$32,537	10	10

Source: American Community Survey, 2008-2012, 5 Year Average

Long-term population trends from 1990 to 2013 vary among individual study area communities, with most showing moderate increases. However, Pitkas Point, Holy Cross, and Shageluk populations have decreased significantly in recent years, illustrating the demographic variability within the study Area (Figure 2).

Figure 2. Percent Population Change from 1990 to 2013 for Study Area Communities

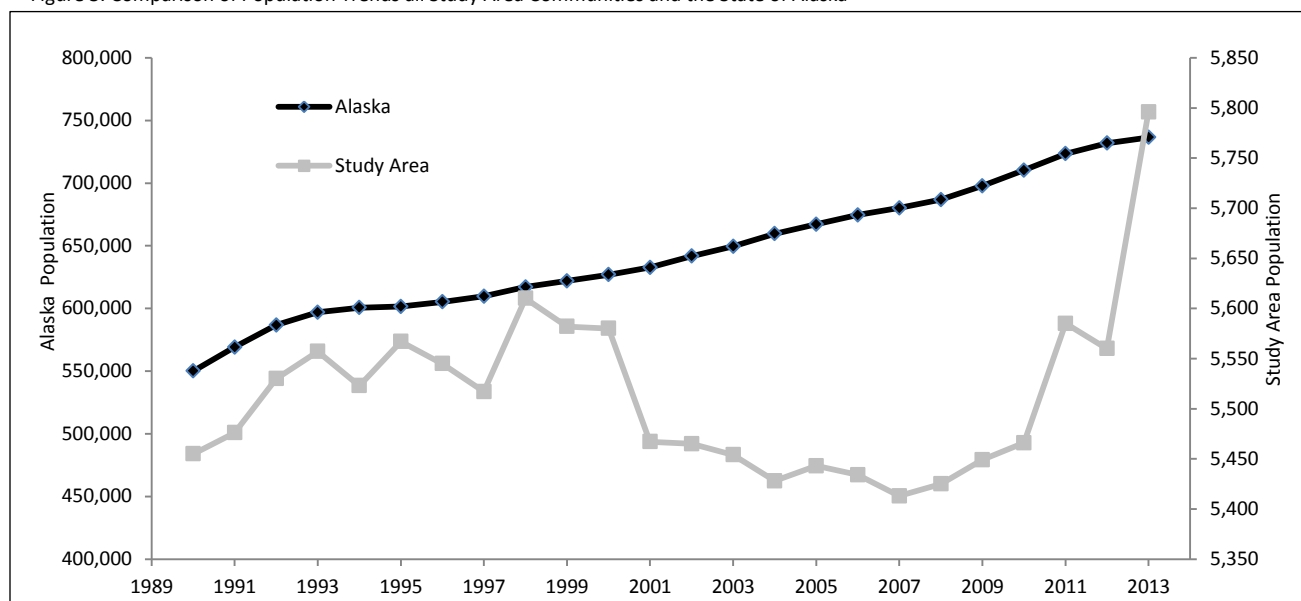


Source: AK DOLWD; U.S. Census Bureau

Population trends for the entire study area demonstrate some growth in recent years, as a result of moderate population growth in some of the larger communities overwhelming decreases in smaller villages. The consistent population growth trend seen statewide has generally not occurred in study area communities on the lower Yukon region (Figure 3).



Figure 3. Comparison of Population Trends all Study Area Communities and the State of Alaska



Source: AK DOLWD; U.S. Census Bureau

Cost of Living

High cost of living is a recognized challenge for rural Alaska communities. Geographic isolation pairs with high shipping and transportation costs to make this a particularly significant economic burden for study area communities. The Wade Hampton District, encompassing 10 of the 14 study area communities, had the fourth highest geographic cost differential in Alaska in 2008 and the second largest increase in cost differential since 1985 (Table 3).

Table 3. Selected Geographical Cost of Living Differences

District Number	District Name	2008 Differential	1985 Differential	Differential Change
8	Anchorage	1	1	0
15	Yukon/Kuskokwim	1.16	1.29	-0.13
19	Wade Hampton	1.48	1.26	0.22

Source: Alaska Geographic Differential Study, 2008, McDowell Group

As previously described, the high cost differentials in study area communities are primarily driven by high fuel costs. The average gasoline and heating fuel prices in Western Alaska are the highest in the state (Tables 4 and 5).

Table 4. Gasoline Prices per Gallon across Alaska, January 2014

	Gulf Coast	Interior	Northern	Northwest	Southeast	Southwest	Western
High	\$7.60	\$10.00	\$9.65	\$7.99	\$5.50	\$8.17	\$8.03
Low	\$3.92	\$3.69	\$4.10	\$5.25	\$4.09	\$4.80	\$6.18
Average	\$5.07	\$5.95	\$6.41	\$6.76	\$4.61	\$6.24	\$6.90

Table 5. #1 Heating Fuel Prices per Gallon across Alaska, January 2014

	Gulf Coast	Interior	Northern	Northwest	Southeast	Southwest	Western
High	\$7.22	\$10.00	\$3.00	\$7.22	\$5.50	\$8.21	\$7.32
Low	\$3.80	\$4.08	\$1.40	\$4.85	\$3.87	\$4.00	\$5.28
Average	\$4.79	\$5.89	\$1.89	\$6.19	\$4.52	\$5.96	\$6.51

Source: Alaska Fuel Price Report, January 2014

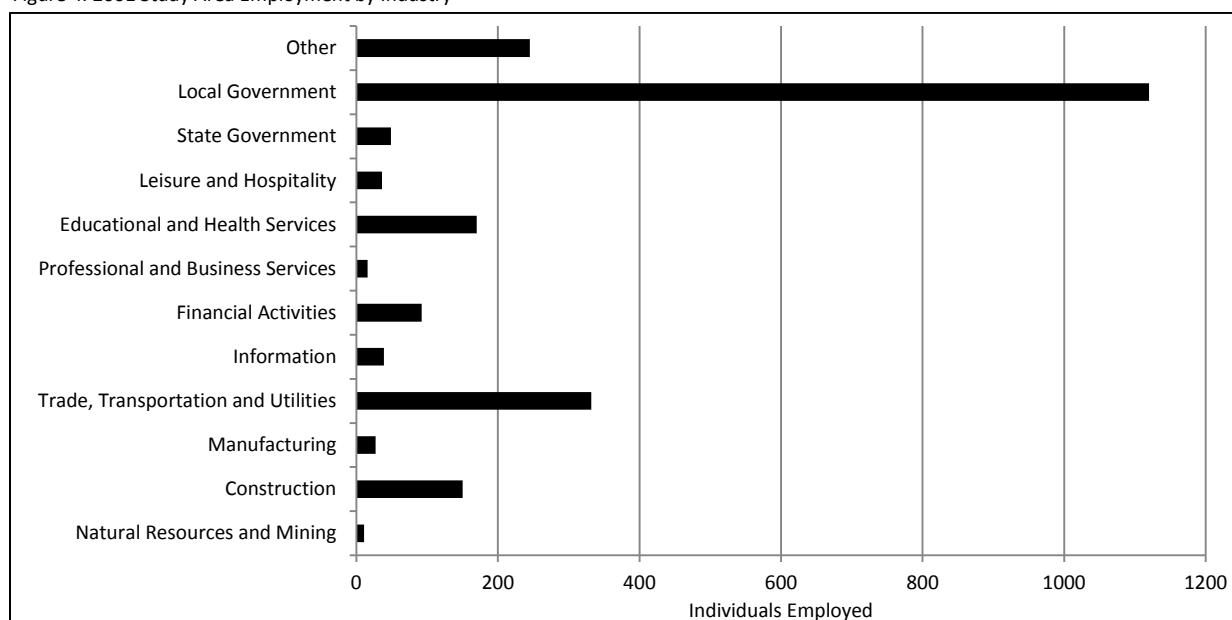


The Denali Commission's distressed community criteria assess the average market income, resident earnings, and year around employment of Alaska communities. This analysis designates all study area communities as distressed in 2012 with the exception of Emmonak, Pitkas Point, St. Mary's, and Anvik. When distressed community criteria were relaxed by 3 percent only St. Mary's and Anvik were designated as non-distressed.

Employment Trends

Economic activity in lower Yukon River communities is highly seasonal, synchronizing with river ice break up beginning in June and lasting until freeze up in October. Subsistence harvest and commercial fishing of Yukon River salmon runs are the primary economic activities of the region. Study area communities are often described as having mixed cash and subsistence economies, with wage employment split evenly between the public and private sectors. Local government and administration is the largest employer in the region, while education and health services, and trade, construction, and transportation related jobs constitute other significant employment opportunities (Figure 4).

Figure 4. 2001 Study Area Employment by Industry



Source: AK DOLWD

Top employers across the region include local school districts and municipalities, Native village corporations, and regional health, housing and community service providers. Kwipak Fisheries, the largest private employer in the region, is based in Emmonak and operates fish buying and transfer stations in several lower Yukon River communities.

The importance of subsistence and commercial fishing to the region cannot be overstated, these activities are not only economic drivers, but are fundamental to the social and cultural fabric of study area communities.

Economic Challenges

Beyond the persistent socioeconomic challenges of poverty, unemployment, low income, and high costs of living, the homogenous economic base of lower Yukon communities is a significant concern for the region. Dependence on unpredictable fish runs and government employment, which is unlikely to increase in the future, inhibits economic growth in study area communities. Furthermore, it renders them persistently vulnerable to natural disasters that have occurred in the recent past and will likely continue to occur in the future. Federal disaster declarations were issued due to Yukon River chinook salmon run failures occurring from 2008 through 2012, resulting in chinook salmon commercial fishing closures throughout the region.



EMMONAK PROFILE

The City of Emmonak is located on the north bank of Kwiguk Pass on the lower Yukon River, about 10 miles from the Bering Sea. Emmonak was incorporated as a second class city in 1964 in the Wade Hampton Census area, and encompasses 7.5 square miles of land and 1.1 square miles of water. More than 800 people, primarily Yupik Alaska Natives, currently live in Emmonak, an increase from 762 in 2000, and 642 in 1990.

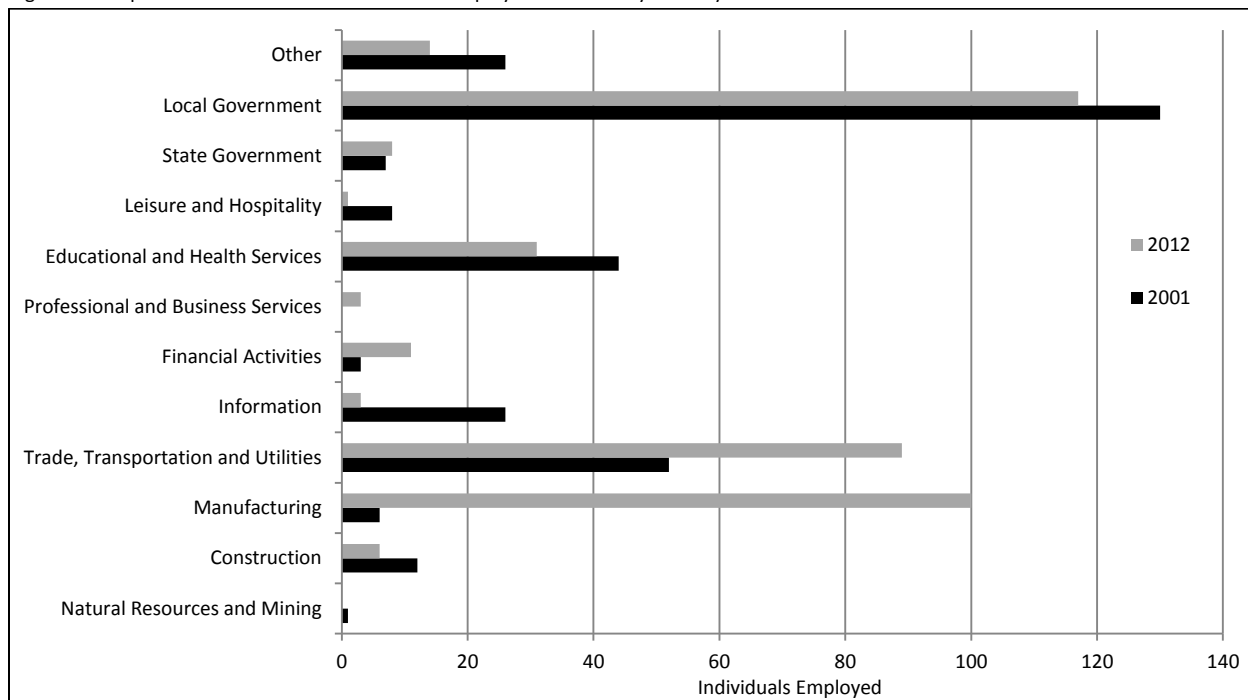
Emmonak shares many of the socioeconomic challenges of neighboring lower Yukon region communities and rural Alaska in general. High rates of poverty and unemployment, low wages, and high costs of living characterize the persistent difficulties of life in Emmonak (Table 2).

In 2011 the Denali Commission's *Distressed Community Report* designated Emmonak as distressed, but in 2012 it received a non-distressed designation. When distressed community criteria were relaxed by 3 percent, Emmonak was again designated as distressed.

Economic Activity in Emmonak

Employment trends in Emmonak differ from other lower Yukon communities. While local government, education, and health services are top employers, the trade, transportation, utilities, and manufacturing sectors employed nearly 200 people in 2012 (Figure 5). Employment by those sectors in the 13 other study area communities combined was only 453. These sectors have seen significant growth in Emmonak over the past 10 years, which can be directly attributed to the establishment and expansion of Yukon Delta Fisheries Development Association (YDFDA) subsidiary businesses.

Figure 5. Comparison of 2001 and 2012 Emmonak Employment Trends by Industry



Source: AK DOLWD



Current Maritime Activity in Emmonak

Despite the lack of a port facility in Emmonak, the Yukon Delta Fisheries Development Association (YDFDA) maritime industry businesses have demonstrated significant growth. These businesses establish Emmonak as an economic center for the region, providing employment, income, and services to residents throughout the lower Yukon.

Kwipak Fisheries, LLC drives maritime economic activity in the lower Yukon region in a variety of ways. In 2012, it bought a total of 3,580,969 pounds of salmon through its primary processing facility in Emmonak and remote buying stations in Kotlik, Mountain Village, and St. Mary's. These purchases generated a total ex-vessel value of \$2,899,440 to 486 fishermen in the region. Kwipak Fisheries

is the largest private employer in the region, employing 524 regional workers in 2012, who earned a total of \$2,161,779. This included 170 student workers as part of its Youth Employment Program. Kwipak also supports expanding other commercial harvests by purchasing Yukon whitefish (cisco) and furs from trappers headquartered in Mountain Village.



Local commercial fishermen delivering to a Kwipak Fisheries tender.

The Kwipak facilities in Emmonak are located immediately adjacent to the “City Dock” barge landing site, which is also the proposed project site for the Lower Yukon Regional Port. Currently Kwipak operates the city dock site, using heavy equipment to build an earthen ramp that allows barges to land and offload away from areas of small boat congestion closer to town. Several shipping industry operators emphasized that not only does Kwipak drive economic activity in the region, but they provide critical services that stabilize the minimal existing maritime infrastructure in Emmonak.



Heavy equipment being used to construct an earthen ramp for barge offloading. Photo courtesy of Kwipak Fisheries.



Yukon Marine Manufacturing, another YDFDA subsidiary, operates a skiff building facility in Emmonak. These aluminum skiffs are designed specifically for lower Yukon use and widely favored by local fishermen. In 2012, 26 new skiffs were constructed, numerous repairs were completed, and 29 skiffs were sold. Yukon Marine Manufacturing employs eight residents and has built a total of 219 skiffs since construction began 1999.



Local fishermen in a Yukon Marine Manufacturing build aluminum skiff.

The third YDFDA subsidiary company, Yukon River Towing (YRT), was established in 2010 and headquartered in Emmonak to participate in regional construction projects, gravel hauling, and various other heavy equipment operations. YRT generated nearly \$2,000,000 in annual revenue in 2012, and contributed over \$369,000 in wages to local employees.

Shipping Activity

In addition to the economic activity generated by YDFDA subsidiary businesses, Emmonak's strategic location on the lower Yukon River and preferred ocean barge landing site has made it a regional center for cargo deliveries. Numerous commercial barge lines and construction companies deliver cargo, construction equipment, materials, and fuel to Emmonak. This cargo is often redistributed to other communities on the lower Yukon. Since 2002, shipping activity through Emmonak has seen steady increases in both cargo and container deliveries (Table 6 and Figure 6).

Table 6. Cargo Moved Through the Port of Emmonak from 2002-2011

Year	Containers		General Cargo	Total Cargo
	#	Tons	Tons	Tons
2002	450	4,200	10,900	15,100
2003	850	8,200	15,600	23,800
2004	900	8,900	16,200	25,100
2005	950	9,200	16,600	25,800
2006	1,450	14,000	21,900	35,900
2007	1,300	12,600	20,300	32,900
2008	1,400	13,800	21,600	35,400
2009	2,500	14,600	22,600	37,200
2010	1,600	15,700	35,400	51,100
2011	1,700	16,800	25,000	41,800

Figure 6. Tons of Cargo Moved Through the Port of Emmonak from 2002-2011
Source: City of Emmonak



Cargo, equipment, and materials delivered to Emmonak support a variety important local and regional infrastructure projects. Planned, underway, and completed projects demonstrate the type of infrastructure development actively occurring in the region that will require continued barge delivery services through Emmonak (Table 7).

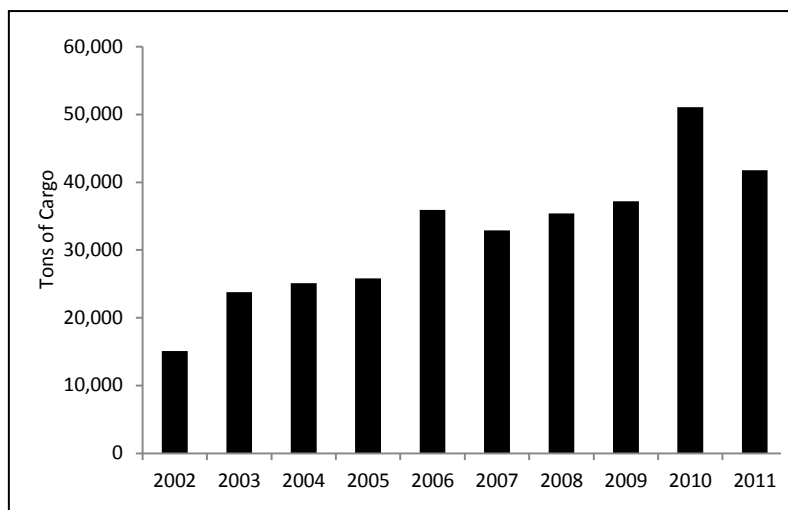


Table 7. List of Regional Infrastructure Projects

Source: Municipality of Emmonak

Project	Community	Cooperating Agency	Status
New Power Plant	Emmonak	AVEC	Planning
Tank Farm Update and Expansion	Emmonak	AVEC	Planning
Water and Sewer System Upgrades	Emmonak	DEC	Completed 2010
Upland Flood Protection Pad	Emmonak	FEMA	Planned, permitting in progress
Power Inter-tie	Emmonak, Alakanuk	AVEC	Completed
4 Wind Turbines	Emmonak	AVEC	Completed
School Remodel/Rebuild	Emmonak	DEED	Underway, estimated completion by Sept. 2014
Landfill Project and Road	Emmonak	DOT	Contract awarded, estimated completion by Oct 2014
Upgrades of Community Roads	Emmonak	DOT	Underway, estimated completion in Oct 2014
Revetments on River Waterfront	Emmonak	USACE	Completed
Elevated Board Road	Nunam Iqua	AVCP	Completed
Road Upgrade Project	Alakanuk	ACVP	Planned
Elevated Board Road	Hamilton	AVCP	Planned

Port Management and Coordination Challenges

Several key informants active in the shipping industry in the lower Yukon region expressed serious concerns about local management capacity. They described local disputes and management disorganization in Emmonak that can prevent efficient shipping and fuel distribution. These inefficiencies drive up costs and stifle industry activity in the area. Additionally, ongoing difficulties in the current fuel storage and distribution system, combined with conflicts between the city and local maritime industry businesses gave rise to concerns of long-term reliability of operating in Emmonak.

In the face of these existing difficulties, the LYRR Port project may be viewed as an opportunity to develop local infrastructure and workforce management capacity. Investments in additional physical infrastructure will not produce any positive economic impacts for a community when the underlying management capacity to operate the facilities is unreliable. Investment in training, management capacity building, industry coordination, and development must occur in concert with infrastructure improvements to produce the potential economic impacts described in this report. Specifically, this may include coordination with state or other municipal maritime industry regulatory authorities, hiring outside consultants to assist in planning and drafting of regulatory documents, and close cooperation with local industry partners.



CURRENT BARGE LANDING CHALLENGES

Several significant challenges limit maritime industry growth in Emmonak. The construction and organized management of the LYRR Port project should specifically address these issues.

Overcrowding and Congestion

During seasonally busy periods, the dedicated barge landing area on the east end of town, locally referred to as the “City Dock,” has proven insufficient to meet current need. This beach landing area suffers severe congestion and barge backups. The unimproved landing site consists of bare riverbank soils, which are constructed into a temporary earthen ramp using heavy equipment. Tugs then maneuver barges and push them onto the ramp, holding them in place under power as the barge is offloaded. Heavy equipment is also used as temporary moorings to hold barges in place during offloading.

This offloading procedure is difficult, inefficient, and poses considerable risk to shipping industry personnel and equipment. The time and complexity of these operations increase the cost of delivery and create major back-ups as barges await their chance to offload.

Port Regulation

A related issue is the lack of any formal barge offloading management or regulation. Without infrastructure in place, it is difficult to regulate and organize the operations of many different individual carriers. The “free for all” nature of current barge offloading operations exacerbates the existing inefficiency at significant cost to barging companies, who must then pass these costs on to local customers.

The LYRR Port project would provide infrastructure improvements that would allow the City of Emmonak to regulate the vessel traffic into their community. The City of Emmonak has drafted and adopted governance codes for port management operations in anticipation of this project. The regulation of barge operations must utilize an equitable fee structure that would generate revenue while encouraging continued maritime activity and development. It is critical regulations are imposed in a way that supports future industry growth and investment in Emmonak and the region.



A barge being offloaded in Emmonak while being held in place by a tug.
Photo Courtesy of Kwipak Fisheries.



View of barge landing in Emmonak with earthen ramp and heavy equipment being used as mooring. Photo courtesy of Kwipak Fisheries.

Erosion and Flooding

The “City Dock” barge landing area is composed of soft fine-grained beach soils and small rocks. Rock revetments are in place downstream to control erosion closer to town, but no protections exist for the barge landing site. Local accounts estimate 10 to 20 feet of riverbank is lost to erosion in this area each year. The dedicated upland cargo and container staging area in Emmonak is also largely unimproved and subjected to heavy use and wet conditions. Local operators describe an extremely muddy area that can add inefficiency and difficulty to equipment and cargo storage, staging and redistribution.

The poor condition of both the riverbank offloading site and the upland cargo storage area are related to regular erosion and flooding that occurs at the site. Seasonal flooding in the spring and fall is a serious challenge for the community; a flood in 2009 destroyed the previously existing riverbank infrastructure and erosion control revetments. A flood in 2006 inundated the entire community, causing significant damage. These natural phenomena pose a serious threat to the unimproved barge landing site, a nearby storage area leased to Bering Pacific Construction, and the economically important Kwikpak Fisheries seafood processing facility. Bering Pacific has made significant investments to improve this area, demonstrating the need and importance of this area to local maritime industry operators.

The LYRR Port project design links directly to existing revetment protections along the riverbank to control erosion and seasonally flooding. These critical improvements provide basic physical safeguards for the local investments of shipping industry operators and Kwikpak Fisheries. Planning and permitting are also in progress for a raised and reinforced upland flood protection pad adjacent to the port project site. These investments in physical stability will provide the foundation for continued development of active and growing industries in the region.



View of eroded stream bank at current barge landing site in Emmonak.
Photo courtesy of Kwikpak Fisheries.



Barge waiting to be offloaded in Emmonak. Photo courtesy of Kwikpak Fisheries.

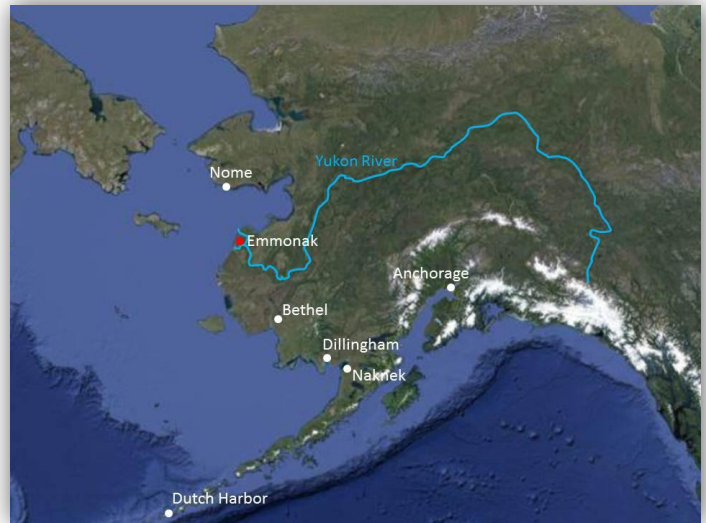
“Something must be done to avoid further erosion and prevent potential damage to Kwikpak Fisheries Processing operation as well as the existing Emmonak Landing which includes Bering Pacific’s leased yard.” Doug Godfrey, Bering Pacific Construction



STATUS AS REGIONAL HUB

Regional Infrastructure Gap

A survey of the ports and harbors serving communities in Southwest and Western Alaska on the Bering Sea reveal a significant gap in maritime infrastructure in the lower Yukon region. Ports in Dutch Harbor and Adak serve the Aleutian Islands while Dillingham and Naknek, are key ports serving Bristol Bay. Moving north from Bristol Bay, the port of Bethel is the only modernized port facility present in the large coastal Yukon-Kuskokwim region, with the next modern port facility being Nome, which is nearly 300 miles to the north. In this part of Western Alaska, the many small isolated communities on the Yukon and Kuskokwim Rivers are often perceived as grouped together into the Y-K Delta. But communities on these two large river systems are entirely separate, and maritime infrastructure in Bethel does not serve communities on the lower Yukon River.



Map of locations with existing port infrastructure in the greater Western Alaska region. Including the location of the proposed LYRR Port in Emmonak.

Emmonak is recognized by local stakeholders, industry operators, and regional planners as the most suitable site for the construction of new maritime infrastructure that would support regional needs. Emmonak is strategically located at the mouth of the Yukon River and accesses the best river channel morphology for ocean barges to maneuver and land safely and efficiently. Emmonak also possesses suitable upland area for cargo staging and storage. The U.S. Army Corps of Engineers (USACE) identified Emmonak as one of its 35 priority barge landing facility improvement sites in Western Alaska. Priority designation is based on the urgency of needed improvements, ease of construction, the frequency of barge deliveries, and the potential impact improvements would have to facility operations. These impacts would include increased operational efficiency, improved worker and environmental safety, and the higher quality of goods and services delivered to the community or region.

Regional Hub Capacity

The regional hub model of marine shipping and transportation is particularly applicable in Alaska. Limited funding is available for maritime infrastructure projects in remote Alaskan communities, so strategic projects that serve multiple communities through efficient redistribution operations maximize the impact of targeted investments.

In the lower Yukon region, Emmonak and Alakanuk are currently operating as redistribution hubs for ocean barge cargo shipments originating primarily in Cook Inlet and Puget Sound. River barges also travel from Nenana and Fairbanks to deliver cargo and equipment for infrastructure projects across western Alaska. Cargo includes basic goods and materials, fuel, construction equipment and material, and significant volumes of rock product for regional infrastructure projects. Ocean barges offload and stage cargo in Emmonak, where it can be stored or redistributed to other lower Yukon communities by smaller in-river vessels. This hub system of maritime infrastructure facilitates efficient fuel and cargo distribution in the lower Yukon region where geographical challenges often limit direct deliveries by large vessels. Other communities on the lower Yukon do receive direct fuel and cargo barge deliveries, but there is demonstrated need for a regional hub that allows for staging and efficient redistribution. Emmonak is

"Improved port facilities in Emmonak will lower costs of shipping materials and fuel throughout the Lower Yukon River and surrounding coastal villages."
Sam Robert Brice, Brice Companies



widely recognized as the most suitable location for regional redistribution hub on the lower Yukon.

ECONOMIC IMPACTS

Economic Stability and Diversity

The LYRR Port project would directly benefit the shipping and construction industries operating in Western Alaska by facilitating more efficient and cost effective operations. These companies are invested in the area, but are persistently challenged by geographical hardships and a lack of proper infrastructure and management.

A new port facility in Emmonak would also directly support the Kwipak Fisheries seafood processing facility and other YDFDA subsidiary businesses. The cost-effective transport of frozen fish products out of Emmonak is a major issue for Kwipak fisheries, as limitations ultimately impact local commercial fishermen who sell their catch to Kwipak. In past years, salmon harvesting and processing activities have been forced to shut down due to limited fish product transport capacity out of Emmonak. Improved barge landing facilities in Emmonak would be attractive to marine shipping companies possibly interested in long-term investments that would stabilize product distribution and encourage continued economic growth in the region through Kwipak Fisheries.



Salmon processing activities at Kwipak Fisheries in Emmonak.

The continued growth of local businesses like Kwipak Fisheries and other private sector industries in Emmonak is critical to long-term economic development in the region. The activity of these businesses diversifies and strengthens the economic base of the region and reduces reliance on government employment and unpredictable fish returns. This diversification is critical to the long-term sustainability of communities in the lower Yukon region that are subject to significant socioeconomic challenges and frequent natural disaster scenarios.

"The Emmonak Port has the potential to spark the regional economy and stabilize the Lower Yukon Region by lowering the costs of shipping goods and fuel" Andrew Guy, President CEO, Calista Corporation

Reduced Cost of Living and Fuel

The 2011 *Planning for Alaska's Regional Ports and Harbors: Final Report* commissioned by USACE, identifies Emmonak as the best investment opportunity in the lower Yukon region. With well-organized management, the proposed LYRR Port project would alleviate congestion and allow for ordered regulation and efficient barge delivery operations into Emmonak. It is anticipated that this directed maritime infrastructure improvement could reduce the costs of delivering cargo to the lower Yukon region. Shipping companies may then be able to improve service and reduce cost of goods delivered to local residents and businesses. The high cost of fuel in the lower Yukon region is the product of high fuel costs statewide and the difficulty associated with delivering fuel to the region. The primary way to reduce fuel costs to Western Alaska is to maximize the efficiency of fuel delivery operations.



Port construction in Emmonak will support efficient fuel shipment and delivery that facilitate less costly offloading operations. These improvements must be tightly coordinated with planned local fuel tank farm improvements that will increase storage capacity. With proper management and coordination, these capacity improvements may allow Emmonak to receive and redistribute fuel at economies of scale that could reduce gasoline, propane, and heating fuel costs across the region.

"The port project has the potential to improve the quality of life for the Yukon residents by helping lower the costs of goods, construction, food, and fuel while facilitating the exportation of fish, gas, or other resources." Martin Moore, Emmonak City Planner

REGIONAL MARITIME OPPORTUNITIES

Increased maritime industry capacity in Emmonak could also allow the region to become involved in several large-scale industry development opportunities.

Intermodal Transportation Linkage

The surface transportation network in Alaska is extremely limited and virtually non-existent in western Alaska. Marine shipping is the most efficient and cost effective means of transporting large amounts of cargo long distances to Alaska and the affordable per unit costs of marine shipping match well with the needs of heavy industry. The proposed LYRR Port could act as an important redistribution waypoint for intermodal connections between marine shipping operations and road and rail networks in interior Alaska. The Yukon River is an important and underutilized shipping and transportation corridor between coastal western Alaska and the surface transportation networks of the interior.

Oil and Gas Development and Arctic Expansion

Increased industrial maritime activity in the Bering, Chukchi and Beaufort Seas is reality. Commercial offshore oil and gas development and international Arctic shipping will become more active as Arctic sea ice continues to recede. While significant infrastructure investments, on a scale much larger than this project, will occur to support this maritime industry expansion, the strategic location of Emmonak may allow it to benefit from these developments. A well-managed and functioning port in Emmonak may provide a variety of support services to expanding Arctic development, from emergency and spill response to fuel provisioning. Industrial cargo and equipment could also be shipped down the Yukon River and redistributed through a port in Emmonak for use in the development of Arctic maritime infrastructure.

The development of oil and gas resources more locally in coastal Western Alaska could also benefit from port infrastructure in Emmonak. Recent legislation also provides tax incentives for oil and gas exploration within a 50 mile radius of Emmonak; the proposed LYRR Port could provide maritime support services to this future development.

Liquefied Natural Gas Distribution

The LYRR Port project may also be linked to future statewide liquefied natural gas (LNG) distribution. The state proposed LNG pipeline project includes an "Energy to the Interior" component that prioritizes supplying gas to Alaskans first before it is exported abroad. Yukon River communities are strategically positioned to receive LNG shipments by intermodal transport from Fairbanks or Nenana or by ocean barge. In a recent speech in Juneau, Governor Parnell described the transport of LNG



or propane to coastal communities in Western Alaska and on the Yukon by marine vessels. These shipments bound for the lower Yukon River could be redistributed through Emmonak to coastal communities across the region.

CONCLUSION

This report describes the proposed LYRR Port project, the socioeconomic characteristics of the region, and the potential impacts of port construction and operation on study area communities.

The communities of the lower Yukon region face some of the most challenging living conditions in Alaska. The high costs of goods and fuel, high unemployment rates, and limited economic opportunity threaten the long-term sustainability of these communities. This project is a modest but durable investment in basic port and barge landing infrastructure that may directly improve the quality of life, health, and safety of local residents. The strategic location of this infrastructure investment may allow Emmonak to act a regional redistribution hub for cargo and fuel, potentially lowering costs of living and supporting local industry. This project may also promote the continued growth and diversification of economic opportunities available to local residents in this struggling region of rural Alaska.

Investments in physical infrastructure alone will not produce the described potential economic benefits for local communities. Concurrent workforce development to manage and efficiently govern shipping and transportation operations in a way that supports industry growth and collaboration is critical the success of this project.

The diverse and challenging geography of Alaska necessitates basic infrastructure capacity to promote cost-effective and efficient transportation and shipping to the remote corners of the state. Rural Alaska depends on these services to develop the short and long-term opportunities that will support community resilience in the face of increasing cultural, economic, and environmental change.



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